

REMARKS / ARGUMENTS

I. General Remarks and Disposition of the Claims

Please consider the application in view of the foregoing amendments and the following remarks. Applicants thank the Examiner for his careful consideration of this application, including the references that Applicants have submitted in this case and, pursuant to MANUAL OF PATENT EXAMINING PROCEDURE § 609.02, all references submitted in the patent applications to which this application claims priority under 35 U.S.C. § 120. Applicants respectfully request that the above amendments be entered and further request reconsideration in light of the amendments and remarks contained herein.

At the time of the Office Action, claims 1, 3-8, 10-19, 21-25, 27-28, 30, 32-36, 39-42, 44, 56, 59-62, 65-73, 82-83, 85-90, 92-95, 97-100, and 103-111 were pending. Claims 1, 3-8, 10-19, 21-25, 27-28, 30, 32-36, 39-42, 44, 56, 59-62, 65-73, 82-83, 85-90, 92-95, 97-100, and 103-111 were rejected in the Office Action.

In this Response, claims 1, 10, 19, 27, 30, 39, 41, 56, 65, 82, 86, and 95 have been amended. These amendments are supported by the specification as filed. All the amendments are made in a good faith effort to advance the prosecution on the merits of this case. It should not be assumed that the amendments made herein were made for reasons related to patentability.

II. Remarks Regarding Double-Patenting Rejections

Claims 1, 3-8, 10-12, 14, 15, 17, 19, 21-28, 30, 32-36, 39-42, 44, 56, 59-62, 65-67, 69, 70, 72, 82, 83, 85-90, 92, 93, 95, 97-100, 103-105, 107, 108 and 110 stand provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 11/183,113. Applicants apologize for the typographical error in the terminal disclaimer submitted with their previous response. Although Applicants do not necessarily agree with substance of the Examiner's rejection, Applicants submit a corrected terminal disclaimer with this response. Accordingly, Applicants respectfully submit that the double-patenting rejections over this application has been overcome, and respectfully request the withdrawal of these rejections.

III. Remarks Regarding Rejections Under 35 U.S.C. § 112

Claims 1, 3-8, 10-19, 21-25, 27, 28, 30, 32-36, 39-42, 44, 56, 59-62, 65-73, 82, 83, 85-90, 92-95, 97-100, and 103-111 stand rejected under 35 U.S.C. § 112, second paragraph. With respect to this rejection, the Office Action states:

Claims 1, 3-8, 10-19, 21-25, 27, 28, 30, 32-36, 39-42, 44, 56, 59-62, 65-73, 82, 83, 85-90, 92-95, 97-100, and 103-111 are rejected under 35 U.S.C. § 112, second paragraph, as being infinite for failing to particularly point out and distinctly claim the subject matter the Applicant regards as the invention. Independent claims 1, 19, 30, 41, 56, 82, 86 and 95 have been amended to limit “at least a portion of” the PVP nanoparticle source to have an average particle size of less than 1,000 nanometers. It is unclear from the claim language and from the specification as to how a person skilled in the art is to determine the quantity/amount of PVP nanoparticle source that the limitation “at least a portion of” encompasses.

(Office Action at 3-4.) Although Applicants do not necessarily agree with the merits of the Office Action’s rejection of these claims, Applicants have amended claims 1, 10, 19, 27, 30, 39, 41, 56, 65, 82, 86, and 95 to remove the language to which the Office Action has objected. It should not be assumed that these amendments narrow the scope of the claims, or that these amendments were made for reasons relating to patentability. Thus, Applicants respectfully request withdrawal of these rejections.

IV. Remarks Regarding Rejections Under 35 U.S.C. § 102(b)

A. Claims 56, 62, 65, 66, 67, 69, 70, 82, and 83 Over Lee

Claims 56, 62, 65, 66, 67, 69, 70, 82, and 83 stand rejected under 35 U.S.C. 102(b) as being anticipated by USPN 7,348,365 B2 to Lee (“Lee”). With respect to these rejections, the Office Action states:

Lee discloses a colloid solution of metal nanoparticles and/or metal-polymer nanocomposites having a uniform particles diameter, wherein the polymer can be PVP. (Abstract; col. 2, lines 27-35; col. 3, lines 25-47; col. 4, lines 42-56). The PVP component can be present in 0.1 to 10 parts by weight. (Col. 3, lines 63-67). The solution can contain water, salt, a scavenger and other additives. (Col. 3, lines 2-17 and 53-62). Lee discloses in Example 2 a nanoparticle colloid solution containing PVP, wherein the average particle diameter is 10 to 12 nanometers.

Thus, the claims are anticipated by Lee.

(Office Action at 4). Applicants respectfully disagree. Applicants respectfully submit that the cited reference does not disclose each and every limitation of claims 56, 62, 65, 66, 67, 69, 70, 82, and 83 as required to anticipate these claims under 35 U.S.C. § 102(b). *See* MANUAL OF PATENT EXAMINING PROCEDURE (“MPEP”) § 2131 (2008).

First, with respect to independent claims 56 and 82 (and their respective dependent claims), *Lee* fails to disclose a subterranean drilling fluid. Nowhere does *Lee* disclose or even suggest this recitation. Instead, *Lee* discloses a solution of metal nanoparticles for use as “an antibacterial agent, a deodorizing agent, a conductive adhesive, conductive ink, and a (sic) electromagnetic wave shielder for an image display.” (*Lee*, abstract; col. 2, lines 53-61.)

Moreover, with respect to claim 56 (and its dependent claims), *Lee* fails to disclose a fluid that comprises a bridging agent. Although *Lee* does mention metal salts included in the fluids disclosed therein, there is no indication that these metal salts have the requisite properties (e.g., particle size) to satisfy the requirements of a bridging agent as understood by a person of ordinary skill in the art. Indeed, *Lee* discloses that the metal salt is “well dissolved in water” or other solvent used in the fluids disclosed therein, and thus it could not act as a bridging agent. (See *Lee* at col. 3, lines 22-24 & 52-54.) Moreover, as noted above, *Lee* discloses solutions used in applications that are entirely unrelated to subterranean operations. Indeed, since the fluids disclosed in *Lee* are not introduced into subterranean formations, there is no logical reason to include a bridging agent in those fluids.

Finally, with respect to claim 82 (and its dependent claims), *Lee* fails to disclose a fluid that comprises a scale inhibitor as recited in claim 82, as amended. Indeed, as noted above, *Lee* discloses solutions used in applications that are entirely unrelated to subterranean operations. There is no disclosure, suggestion, or reason presented in *Lee* or anywhere else in the pertinent art to include a scale inhibitor in the fluids disclosed in *Lee*, which are completely unrelated to the drilling fluids claimed in Applicants’ claim 82.

Therefore, for at least the reasons discussed above, independent claims 56 and 82 are not anticipated by *Lee*. Moreover, since “a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers,” and since claims 62, 65, 66, 67, 69, 70, and 83 depend, either directly or indirectly, from independent claim 56 or 82, these dependent claims are allowable for at least the same reasons. See 35 U.S.C. § 112 ¶ 4 (2004). Accordingly, Applicants respectfully request the withdrawal of these rejections.

B. Claims 56, 62, 65-73, 82, 83, 95, and 100-111 Over Ryde

Claims 56, 62, 65-73, 82, 83, 95, and 100-111 stand rejected under 35 U.S.C. 102(b) as being anticipated by USPN 7,276,249 B2 to Ryde et al. (hereinafter “*Ryde*”). With respect to these rejections, the Office Action states:

Ryde discloses nanoparticulate compositions comprising up to 99.5% of fenofibrate, at least one surface stabilizer absorbed on the surface of the drug and further excipients, wherein the nanoparticulate fenofibrate particles have an effective average particle size of less than about 2000 nm, particularly 50 nm to 2 microns. (Col. 5, lines 3-19; col. 19, lines 49-65; col. 20, lines 34-37). The nanoparticulate composition can further contain water and/or aqueous salt solution as a solvent, such as potassium chloride (col. 12, lines 51-58; col. 22, lines 20-37); stabilizers, such as biopolymers and cellulosic/polysaccharide derivatives (col. 15, lines 56-66; col. 16, lines 40-49); and a lubricant (col. 19, lines 9-12).

Ryde further teaches that the nanoparticulate fenofibrate composition can further contain crosslinked PVP (crospovidone) as a disintegrant (col. 19, lines 33-34) and a carbonate or bicarbonate effervescent agent ("weighting agent") in col. 19, lines 36-47. (See, e.g. exemplary formulations on tables on bottom of column 20 and on column 21 disclosing crospovidone as component present in about 10%). Ryde also discloses the nanoparticulate composition provided in liquid dosage forms, dispersive forms and spray forms, wherein the solvent can be water. (Col. 24, lines 32-44; Table 3 on col. 26; Tables 9, 12, and 17).

Particularly, in col. 17, lines 33, Ryde discloses a granulated feed dispersion of a nanoparticulate formation in purified water containing crospovidone. (Table 18). Therefore, in accordance with Tables 18-20, if about 427.3 g/Kg of the composition is dispersed/diluted in 572.7 g/Kg of purified water, the amount of crospovidone in the water dispersion will be about half of that present in the resultant tablet formulation (less than 5%).

Thus, the claims are anticipated by Ryde.

(Office Action at 4-5). Applicants respectfully disagree. Applicants respectfully submit that the cited reference does not disclose each and every limitation of claims 56, 62, 65-73, 82, 83, 95, and 100-111 as required to anticipate these claims under 35 U.S.C. § 102(b). *See* MPEP § 2131.

First, *Ryde* fails to disclose a subterranean drilling fluid, as recited in independent claims 56, 82, and 95 (and their respective dependent claims). Nowhere does *Ryde* disclose or even suggest this *recitation*. Instead, *Ryde* discloses certain improved compositions useful in pharmaceutical applications. (*Ryde*, abstract; col. 5, lines 10-16.)

Moreover, *Ryde* fails to disclose a polyvinyl pyrrolidone nanoparticle source that comprises nanoparticles of polyvinyl pyrrolidone having an average particle size of less than about 1,000 nanometers, as recited in independent claims 56, 82, and 95. Although *Ryde* does disclose compositions that comprise nanoparticulate fenofibrates, *Ryde* discloses that those fenofibrates are a component of a larger pharmaceutical composition, and the PVP disintegrant is simply an additional component of that larger pharmaceutical composition.

[column 14, ll. 33-52]

B. Compositions

The invention provides *compositions comprising fibrate, preferably fenofibrate, particles* and at least one surface stabilizer.

...

The present invention also includes fibrate, preferably fenofibrate, compositions together with one or more non-toxic physiologically acceptable carriers, adjuvants, or vehicles, collectively referred to as carriers. The compositions can be formulated for parenteral injection (e.g., intravenous, intramuscular, or subcutaneous), oral administration in solid, liquid, or aerosol form, vaginal, nasal, rectal, ocular, local (powders, ointments or drops), buccal, intracisternal, intraperitoneal, or topical administration, and the like.

[column 18, l. 63 - column 19, l. 2]

3. Other Pharmaceutical Excipients

Pharmaceutical compositions according to the invention may also comprise one or more binding agents, filling agents, lubricating agents, suspending agents, sweeteners, flavoring agents, preservatives, buffers, wetting agents, *disintegrants* [which may comprise PVP], effervescent agents, and other excipients. Such excipients are known in the art.

(*Ryde* at col. 14, lines 33-52 & col. 18, l. 63 - col. 19, l. 2 (emphases added).) However, this provides no disclosure or teaching that the PVP disintegrants themselves are comprised of nanoparticles. For a prior art reference to anticipate a claim, that reference “must clearly and unequivocably disclose the claimed compound or direct those skilled in the art to the compound without *any* need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference.” *In re Arkley*, 455 F.2d 586, 587 (C.C.P.A. 1972); *see Azko v. U.S. Internat'l Trade Comm'n*, 808 F.2d 1471, 1480 (Fed. Cir. 1986); *see,*

e.g., *Ex parte Ruzakowski et al.*, Appeal No. 2006-2511, 2006 WL 2725748, at *2 (Bd. Pat. App. & Interf. Sept. 20, 2006); *Ex parte Johnson et al.*, Appeal No. 2006-0070, 2006 WL 1665466, at *3 (Bd. Pat. App. & Interf. Jan. 25, 2006). The Office Action combines teachings relating to completely different elements of the pharmaceutical compositions disclosed in *Ryde* (i.e., the nanoparticulate fibrate and the PVP disintegrant), which cannot form a proper basis for a rejection under § 102.

Next, with respect to claim 56 (and its dependent claims), *Ryde* fails to disclose a fluid that comprises a bridging agent. Although *Ryde* does mention salts included in the compositions disclosed therein, there is no indication that these salts have the requisite properties (e.g., particle size) to satisfy the requirements of a bridging agent as understood by a person of ordinary skill in the art. Indeed, as noted above, *Ryde* discloses solutions used in pharmaceutical applications, which are entirely unrelated to subterranean operations. There is no disclosure, suggestion, or reason presented in *Ryde* or anywhere else in the pertinent art to include a bridging agent in the compositions disclosed in *Ryde*, which are completely unrelated to the drilling fluids claimed in Applicants' claim 56. Indeed, since the fluids disclosed in *Ryde* are not introduced into subterranean formations, there is no logical reason to include a bridging agent in those fluids.

Finally, with respect to claim 82 (and its dependent claims), *Ryde* fails to disclose a fluid that comprises a scale inhibitor as recited in claim 82, as amended. Indeed, as noted above, *Ryde* discloses solutions used in applications that are entirely unrelated to subterranean operations. There is no disclosure, suggestion, or reason presented in *Ryde* or anywhere else in the pertinent art to include a scale inhibitor in the fluids disclosed in *Ryde*, which are completely unrelated to the drilling fluids claimed in Applicants' claim 82.

Therefore, for at least the reasons discussed above, independent claims 56, 82, and 95 are not anticipated by *Ryde*. Moreover, since "a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers," and since claims 62, 65-73, 83, and 100-111 depend, either directly or indirectly, from independent claim 56, 82, or 95, these dependent claims are allowable for at least the same reasons. *See* 35 U.S.C. § 112 ¶ 4 (2004). Accordingly, Applicants respectfully request the withdrawal of these rejections.

V. Remarks Regarding Rejections Under 35 U.S.C. § 103(a)

A. Claims 1, 4-8, 10-19, 21-25, 27, 28, 30, 33-36, 39-42, 44, 56, 59-62, 65-73, 82, 83, 85-90, 92-95, 97, 98, 100, and 103-111 Over Stowe in View of Heilweil and Carpenter.

Claims 1, 4-8, 10-19, 21-25, 27, 28, 30, 33-36, 39-42, 44, 56, 59-62, 65-73, 82, 83, 85-90, 92-95, 97, 98, 100, and 103-111 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2002/0160919 to Stowe, II *et al.* ("Stowe") in view of USPN 4,498,994 to Heilweil ("Heilweil") and further in view of USPN 3,252,904 to Carpenter ("Carpenter"). With respect to these rejections, the Office Action states:

Stowe discloses a water-based drilling fluid composition containing a polymeric latex capable of providing a deformable latex film or seal on at least a portion of a subterranean formation, wherein the polymeric latex provides reduction of the rate of drilling fluid pressure in the borehole wall of the subterranean formation during drilling and enhanced flocculation properties; wherein the essential components of the water-based drilling fluids are the polymer latex and water. (Abstract; Page 2, [0022] and [0023]; Table 1) The polymer latex is preferably a carboxylated styrene/butadiene copolymer and the average particle size of the polymer latex can be less than 1 micron (1000 nanometers) and preferably has a diameter of about 0.2 microns (200 nm) or less. (Page 2, [0024]) The proportion of the polymer latex in the drilling mud can range from about 0.1 to about 10 vol. %. (Page 2, [0024])

Stowe further disclose the drilling fluid composition/latex further containing salt, such as potassium chloride; a precipitating agent; and surfactant, whereas the water can be fresh water. (Page 2, [0025] to [0028]) Other additives can be added to help balance the fluid properties. (Page 2, [0023])

However, Stowe does not expressly disclose the latex composition further containing PVP.

Heilweil and Carpenter were discussed previously in item 5 on page 3 of OA and all the grounds of rejection therein are incorporated herein.

As discussed in OA, Heilweil teaches a drilling fluid composition, and a method of drilling using thereof comprising, e.g., 1.5% polyvinylpyrrolidone (PVP); solvent; water (aqueous based fluid); clay (weighting agent); and salt. (Abstract; col. 3, lines 1-33; Examples 1 and 5) This drilling fluid is effective in reducing the swelling and dispersion of formation clay and shale. (Col. 5, lines 33-56; Shale inhibition test on page 5)

Heilweil further teaches that adding PVP as a polymeric thickener to a drilling fluid provides desirable stability properties

to the fluid composition, particularly at high temperatures, including providing the drilling fluid with enhanced filtration loss properties; ability to dissolve salt; increased miscibility with water; preferred boiling point and flash point viscosity. (Abstract; col. 3, lines 1-21 and 37-60; col. 5, lines 53-56; Table I; Examples)

Although Heilweil does not disclose the particle size of the PVP used in the drilling fluid mud, as discussed in item 5 of OA, Carpenter teaches adding crosslinked PVP to a fluid composition for use in a subterranean formation application having a particle size of less than about 20 to 60 mesh. (Col. 7, lines 31-60; Table IV; Drawing) The drawing in Carpenter depicts rates of swelling inhibition with respect to particle size. (Col. 7, line 68 to col. 8, line 18) Carpenter further teaches that the rate of swelling activity (fluid-loss control rheology) of the crosslinked PVP particles in brine/water can be adjusted by particle size to attain a preferred rate of fluid loss control in the subterranean formation application. (Col. 8, lines 26-61)

Therefore, it would have been obvious to a person of ordinary skill in the art at the time that the claimed invention was made to add PVP to the aqueous drilling fluid composition disclosed in Stowe. It would have been obvious to one skilled in the art to do so to attain a resultant method of drilling (Stowe and Heilweil) that is more efficient due to the use of a drilling fluid composition having enhanced stability properties provided by PVP as taught by Heilweil.

Moreover, it would have been obvious to a person of ordinary skill in the art at the time that the invention was made to modify the particle size of the PVP component of the drilling fluid composition used in Stowe and Heilweil's method of drilling a well bore. It would have been obvious to one skilled in the art to incorporate a preferred particle size of PVP in the aqueous drilling fluid composition to be able to manipulate the degree of fluid-loss control and attain a resultant method of drilling that is more efficient as taught by Carpenter. That is, it would have been obvious to use a particle size for the PVP within the range disclosed in Stowe for the polymer latex because both additives are used primarily for the same purpose (stabilize the formation). Accordingly, it would have been obvious to choose to use PVP particles in the drilling fluid that are small enough (less than 1000 microns as disclosed in Stowe for the latex component) to attach/seal pores in the subterranean formation to stabilize and inhibit shale formation.

Thus the instant claims are unpatentable over Stowe, Heilweil and Carpenter.

(Office Action at 6-8.) Applicants respectfully disagree with these rejections.

In order to form a basis for a § 103(a) rejection, a combination of prior art references must teach or suggest each element in the claim, or there must be some teaching, suggestion, or other rationale for why a person of skill in the art would modify the prior art teachings to include any missing elements with a reasonable expectation of success. *See* MPEP §§ 2142 & 2143. However, there is no teaching, suggestion, or logical rationale for combining the teachings of *Stowe*, *Heilweil*, and *Carpenter* in the manner described in the Office Action to arrive at the claimed invention. Specifically, the cited combination does not make obvious the inclusion of a polyvinyl pyrrolidone nanoparticle source that comprises nanoparticles of polyvinyl pyrrolidone having an average particle size of less than about 1,000 nanometers in the drilling fluids described in *Stowe*.

The Office Action acknowledges that *Heilweil* does not disclose the particle size of the PVP component described therein, but instead asserts that *Carpenter* “teaches that the rate of swelling activity (fluid loss control rheology) of the crosslinked PVP particles in brine/water can be adjusted by particle size to attain a preferred rate of fluid loss control in the subterranean formation application.” (Office Action at 7-8.) For this reason, the Office Action asserts that a person of skill in the art would be motivated to adjust the particle size of the PVP component in a drilling fluid “to manipulate the degree of fluid-loss control and attain a resultant method of drilling that is more efficient as taught by *Carpenter*.” (*Id.* at 8.)

First, Applicants respectfully disagree that *Carpenter* teaches that the particle size of the PVP component of *Heilweil* (or a similar PVP component added to the drilling fluids in *Stowe*) could be modified to control fluid loss. The only effect of PVP polymer particle size that *Carpenter* demonstrates is “in delaying the action of acids upon earth formations in comparison to ordinary aqueous acid solutions” in fluids used to *acidize* a subterranean formation, thereby delaying the formation of cracks in the formation through which fluid may be lost. (*Carpenter* at col. 7, lines 31-34.) However, the *drilling* fluids in *Stowe* and *Heilweil* do not comprise acids at all, and thus *Carpenter*’s teachings do not suggest how alteration of PVP particle size could have any effect on fluid loss control in those drilling fluids. In contrast, fluid loss is controlled in *Heilweil* and *Stowe* via viscosification of the drilling fluid (Office Action at 7; *Heilweil* at col. 3, ll. 1-22) or the formation of a film or seal on the inside wall of a borehole in a subterranean formation (*Stowe* at ¶0022), respectively. *Carpenter* does not suggest that alteration of particle size would have any effect on such fluid loss mechanisms, nor does the Office Action offer any other reason to

reasonably expect success in altering the particle size of PVP in any of these mechanisms. Indeed, the methods for *sealing permeable* portions of a subterranean formation described in *Stowe* would be entirely incompatible with the methods described in *Carpenter*, which acidize a formation to *increase its permeability*. Thus, a person of skill in the art would not understand from *Carpenter* that adjusting particle size of a PVP or latex component in the drilling fluids disclosed in *Heilweil* or *Stowe* would have any desirable effect whatsoever.

Moreover, even if *Carpenter* did teach alteration of PVP particle size pertinent to *Stowe* or *Heilweil*, it certainly does not suggest that the particle size of a PVP component may be reduced to the magnitude of nanoparticles, much less to than about 1,000 nanometers (as recited in claims 1, 19, 30, 41, 56, 82, 86, and 95) or less than about 400 nanometers (as recited in claims 10, 27, 39, 65, 92, and 103). The smallest particle sizes disclosed in *Carpenter* are 40-60 mesh (*Carpenter* at col. 8, l. 5) or 251,000 - 422,000 nanometers—orders of magnitude larger than any nanoparticle or the size ranges recited in Applicants' claims. Thus, *Carpenter* can supply no expectation that the use of nanoparticle PVP would be successful in the applications disclosed in *Heilweil* and *Stowe*.

The Office Action further cites *Stowe* for a motivation to alter the particle size of PVP to a nanoparticle scale, asserting that “it would have been obvious to use a particle size for the PVP within the range disclosed in *Stowe* for the polymer latex because both additives are used primarily for the same purpose (stabilize the formation).” Applicants respectfully disagree because the function of the PVP in *Heilweil* and the nanoparticle latex in *Stowe* are completely different. *Heilweil* discloses that PVP polymers *stabilize properties of the drilling fluid* at high temperatures. (See *Heilweil* at Abstract.) In contrast, *Stowe* discloses the use of latex to form “a deformable latex film or seal on at least a portion of the subterranean formation” *to stabilize the formation itself*. (See *Stowe* at ¶ 0022.) The functionality of nanoparticles in *Stowe* has no application whatsoever to the stabilization of a fluid accomplished by the PVP polymers in *Heilweil*, and thus the combination of these teachings would constitute impermissible hindsight that cannot form the basis for an obviousness rejection. See MPEP § 2142 (“impermissible hindsight must be avoided and the legal conclusion [of obviousness] must be reached on the basis of the facts gleaned from the prior art”).

Thus, for the reasons discussed above, Applicants respectfully submit that the combination of *Stowe*, *Heilweil*, and *Carpenter* does not make obvious the inclusion of a polyvinyl

pyrrolidone nanoparticle source that comprises nanoparticles of polyvinyl pyrrolidone having an average particle size of less than about 1,000 nanometers in the drilling fluids described in Stowe, as recited in independent claims 1, 19, 30, 41, 56, 82, 86, and 95. Therefore, for at least the reasons discussed above, independent claims 1, 19, 30, 41, 56, 82, 86, and 95 are not obvious over *Stowe* in view of *Heilweil* and *Carpenter*. Moreover, since “a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers,” and since claims 4-8, 10-18, 21-25, 27, 28, 33-36, 39, 40, 42, 44, 59-62, 65-73, 83, 85, 87-90, 92-94, 97, 98, 100, and 103-111 depend, either directly or indirectly, from independent claim 1, 19, 30, 41, 56, 82, 86, or 95, these dependent claims are allowable for at least the same reasons. *See* 35 U.S.C. § 112 ¶ 4 (2004). Accordingly, Applicants respectfully request the withdrawal of these rejections.

B. **Claims 1, 3-8, 10-19, 21-25, 27, 28, 30, 32-36, 39-42, 44, 56, 59-62, 65-73, 82, 83, 85-90, 92-95, 97-100, and 103-111 Over Stowe, Freifeld, and Carpenter.**

Claims 1, 3-8, 10-19, 21-25, 27, 28, 30, 32-36, 39-42, 44, 56, 59-62, 65-73, 82, 83, 85-90, 92-95, 97-100, and 103-111 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Stowe* in view of USPN 3,504,746 to Freifeld *et al.* (“*Freifeld*”) and further in view of *Carpenter*. With respect to these rejections, the Office Action states:

Stowe and Carpenter were discussed above in the instant action. Stowe does not disclose the drilling fluid latex composition further containing crosslinked PVP.

Freifeld teaches a method of sealing a walled system against fluid passage through its walls, said method comprising injecting an aqueous composition comprising 1 to 20% of crosslinked PVP and a catalytic amount of a redox catalyst system including commercial oxidants and reductants, wherein this composition is added to reduce or eliminate the influx of unwanted fluids; and wherein the crosslinked PVP forms permanent polymeric gels useful in sealing permeable earth formations. (Abstract; col. 2, lines 8-34 and 60-72; col. 3, lines 13-51; Table 1) The PVP composition penetrates the interstices of a porous medium, fills the communicating pores and subsequently crosslinks individual molecules of PVP polymers in the composition to form permanent gels that seals the walls and prevents further flow of fluids through said walls. (Col. 2, lines 23-34)

Freifeld further teaches other advantages for adding PVP to a drilling fluid composition, such as providing the ability to vary initial viscosities over wide ranges by modifying molecular

weights and solution concentrations of PVP so that they have optimal initial viscosities for the particular system being treated; and adjusting the gelation or setting time of polymeric materials to control within sufficiently close limits to optimize penetration into permeable formation is effected. (Col. 2, lines 35-59)

Therefore, it would have been obvious to a person of ordinary skill in the art at the time that the claimed invention was made to add crosslinked PVP to the aqueous drilling fluid composition disclosed in Stowe. It would have been obvious to one skilled in the art to do so to attain a resultant method of drilling (Stowe and Freifeld) that is more efficient due to the use of a drilling fluid composition having enhanced formation stability provided by crosslinked PVP as taught by Freifeld.

Moreover, it would have been obvious to a person of ordinary skill in the art at the time that the invention was made to modify the particle size of the crosslinked PVP component of the drilling fluid composition used in Stowe and Freifeld's method of drilling a well bore. It would have been obvious to one skilled in the art to incorporate a preferred particle size of a crosslinked PVP in the aqueous drilling fluid composition to be able to manipulate the degree of fluid-loss control and attain a resultant method of drilling that is more efficient as taught by Carpenter. That is, it would have been obvious to use a particle size for the crosslinked PVP within the range disclosed in Stowe for the polymer latex because both additives are used primarily for the same purpose (stabilize the formation). Accordingly, it would have been obvious to choose to use crosslinked PVP particles in the drilling fluid composition that are small enough (less than 1000 microns as disclosed in Stowe for the latex component) to attach/seal pores in the subterranean formation to stabilize and inhibit shale formation.

Thus the instant claims are unpatentable over Stowe, Freifeld and Carpenter.

(Office Action at 9-10.) Applicants respectfully disagree with these rejections.

In order to form a basis for a § 103(a) rejection, a combination of prior art references must teach or suggest each element in the claim, or there must be some teaching, suggestion, or other rationale for why a person of skill in the art would modify the prior art teachings to include any missing elements with a reasonable expectation of success. See MPEP §§ 2142 & 2143. However, there is no teaching, suggestion, or logical rationale for combining the teachings of *Stowe*, *Freifeld*, and *Carpenter* in the manner described in the Office Action to arrive at the claimed invention. Specifically, the cited combination does not make obvious the inclusion of a polyvinyl pyrrolidone

nanoparticle source that comprises nanoparticles of polyvinyl pyrrolidone having an average particle size of less than about 1,000 nanometers in the drilling fluids described in *Stowe*.

The Office Action does not assert that *Freifeld* discloses the particle size of the PVP component described therein, but instead asserts that *Carpenter* “teaches that the rate of swelling activity (fluid loss control rheology) of the crosslinked PVP particles in brine/water can be adjusted by particle size to attain a preferred rate of fluid loss control in the subterranean formation application.” (Office Action at 7-8.) For this reason, the Office Action asserts that a person of skill in the art would be motivated to adjust the particle size of the PVP component in a drilling fluid “to manipulate the degree of fluid-loss control and attain a resultant method of drilling that is more efficient as taught by Carpenter.” (*Id.* at 10.)

First, Applicants respectfully disagree that *Carpenter* teaches that the particle size of the PVP component of *Freifeld* (or a similar PVP component added to the drilling fluids in *Stowe*) could be modified to control fluid loss. As discussed above, the only effect of PVP polymer particle size that *Carpenter* demonstrates is “in delaying the action of acids upon earth formations in comparison to ordinary aqueous acid solutions” in fluids used to *acidize* a subterranean formation, thereby delaying the formation of cracks in the formation through which fluid may be lost. (*Carpenter* at col. 7, lines 31-34.) However, the fluids in *Stowe* and *Freifeld* do not comprise acids at all, and thus *Carpenter*’s teachings do not suggest how alteration of PVP particle size could have any effect on fluid loss control in those drilling fluids. In contrast, fluid loss is controlled in *Freifeld* and *Stowe* via the penetration of interstices in the pore spaces of a formation (*Freifeld* at col. 2, ll. 25-31) or the formation of a film on the inside wall of a borehole in a subterranean formation (*Stowe* at ¶ 0022), respectively. *Carpenter* does not suggest that alteration of particle size would have any effect on such fluid loss mechanisms, nor does the Office Action offer any other reason to reasonably expect success in altering the particle size of PVP in any of these mechanisms. Indeed, the methods for *sealing permeable* portions of a subterranean formation described in *Freifeld* and *Stowe* would be entirely incompatible with the methods described in *Carpenter*, which acidize a formation to *increase its permeability*. Thus, a person of skill in the art would not understand from *Carpenter* that adjusting particle size of a PVP or latex component in the drilling fluids disclosed in *Freifeld* or *Stowe* would have any desirable effect whatsoever.

Moreover, even if *Carpenter* did teach alteration of PVP particle size pertinent to *Stowe* or *Freifeld*, it certainly does not suggest that the particle size of a PVP component in *Freifeld*

may be reduced to the magnitude of nanoparticles, much less to than about 1,000 nanometers (as recited in claims 1, 19, 30, 41, 56, 82, 86, and 95) or less than about 400 nanometers (as recited in claims 10, 27, 39, 65, 92, and 103). The smallest particle sizes disclosed in *Carpenter* are 40-60 mesh (*Carpenter* at col. 8, l. 5) or 251,000 - 422,000 nanometers—orders of magnitude larger than any nanoparticle or the size ranges recited in Applicants' claims. Thus, *Carpenter* can supply no expectation that the use of nanoparticle PVP would be successful in the applications disclosed in *Freifeld* and *Stowe*. Similarly, *Freifeld* specifies the use of PVP polymers “available commercially,” which would not have included a recognizable amount of PVP nanoparticles when the disclosure of *Freifeld* was filed in 1968. (See *Freifeld* at col. 2, ll. 60-64.)

The Office Action further cites *Stowe* for a motivation to alter the particle size of PVP to a nanoparticle scale, asserting that “it would have been obvious to use a particle size for the PVP within the range disclosed in *Stowe* for the polymer latex because both additives are used primarily for the same purpose (stabilize the formation).” However, there is no reason that a person of ordinary skill could expect that *Freifeld*'s PVP polymers “available commercially” in 1968 could be successfully substituted with nanoparticle PVP simply because *Stowe* discusses the use of a completely different additive on a nanoparticle scale. Such a combination would employ impermissible hindsight that cannot form the basis for an obviousness rejection. See MPEP § 2142 (“impermissible hindsight must be avoided and the legal conclusion [of obviousness] must be reached on the basis of the facts gleaned from the prior art”).

Thus, for the reasons discussed above, Applicants respectfully submit that the combination of *Stowe*, *Freifeld*, and *Carpenter* does not make obvious the inclusion of a polyvinyl pyrrolidone nanoparticle source that comprises nanoparticles of polyvinyl pyrrolidone having an average particle size of less than about 1,000 nanometers in the drilling fluids described in *Stowe*, as recited in independent claims 1, 19, 30, 41, 56, 82, 86, and 95. Therefore, for at least the reasons discussed above, independent claims 1, 19, 30, 41, 56, 82, 86, and 95 are not obvious over *Stowe* in view of *Freifeld* and *Carpenter*. Moreover, since “a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers,” and since claims 3-8, 10-18, 21-25, 27, 28, 33-36, 39, 40, 42, 44, 59-62, 65-73, 83, 85, 87-90, 92-94, 97-100, and 103-111 depend, either directly or indirectly, from independent claim 1, 19, 30, 41, 56, 82, 86, or 95, these dependent claims are allowable for at least the same reasons. See 35 U.S.C. § 112 ¶ 4 (2004). Accordingly, Applicants respectfully request the withdrawal of these rejections.

VI. No Waiver

All of Applicants' arguments and amendments are without prejudice or disclaimer. Additionally, Applicants have merely discussed example distinctions from the cited references. Other distinctions may exist, and Applicants reserve the right to discuss these additional distinctions in a later Response or on Appeal, if appropriate. By not responding to additional statements made by the Examiner, Applicants do not acquiesce to the Examiner's additional statements, such as, for example, any statements relating to what would be obvious to a person of ordinary skill in the art.

**SUMMARY AND PETITION FOR A THREE-MONTH EXTENSION OF TIME
TO FILE THIS RESPONSE**

In light of the above amendments and remarks, Applicants respectfully request reconsideration and withdrawal of the outstanding rejections. Applicants further submit that the application is now in condition for allowance, and earnestly solicit timely notice of the same. Should the Examiner have any questions, comments or suggestions in furtherance of the prosecution of this application, the Examiner is invited to contact the attorney of record by telephone, facsimile, or electronic mail.

Applicants hereby petition for a three-month extension of time to file this response under 37 C.F.R. § 1.136(a)(3), extending the period for reply from November 11, 2008 to February 11, 2009.

The Commissioner is hereby authorized to debit Baker Botts L.L.P.'s Deposit Account No. 02-0383, Order Number 063718.0358, in the amount of \$1,250.00 for (1) the fee of \$140.00 under 37 C.F.R. § 1.20(d) for filing a terminal disclaimer, and (2) the fee of \$1,110.00 under 37 C.F.R. § 1.17(a)(3) for the three-month extension of time to file this Response. Applicants believe that no additional fees are due in association with the filing of this response. Should the Commissioner deem that any fees are due, including any fees for extensions of time, Applicants respectfully request that the Commissioner accept this as a Petition Therefor, and direct that any additional fees be charged to Baker Botts, L.L.P.'s Deposit Account No. 02-0383, Order Number 063718.0358.

Respectfully submitted,

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